Claims

1. Method for continuous process transesterification of carboxylic acid esters in supercritical monovalent alcohol corresponding to the general formula R-OH where R indicates any aliphatic hydrocarbon radical having 1 to 10 carbon atoms and which is industrially usable and the parent substances of which are natural, synthetic carboxylic acid esters or their mixtures being for example fats and fat oils which are the esters of different fatty acids and glycerols, **characterized** in that

- the alcohol received from inlet (1) and carboxyl acid ester received from inlet (2) are mixed together in the dosing unit (3), since in molar ratio there are at least two alcohol molecules per ester link in one ester molecule and since the mass part ratio of ester and alcohol is at least 2/1,

- the alcohol and carboxyl acid ester mixture is taken from the dosing unit (3) for pre-heating to the heat exchanger (4),

- the pre-heated mixture is directed from the heat exchanger (4) to transesterification device (5) pump (14) where the pressure of the reaction environment of the mixture is increased to the pressure of at least 25 MPa, whereas the pressure of the reaction environment is 0.5 MPa higher than the critical pressure of the used alcohol,

- thereafter the mixture is directed to the heat source (15) where the temperature of the reaction environment is increased to at least 300 °C, whereas the temperature of the reaction environment exceeds the critical temperature of alcohol used in the process,

- the mixture is directed further to the tube-shaped reactor (16),

- after the reaction time passes, the reaction yields are directed through the outlet valve (17) and tube (6) to the expansion tank (7) where the pressure is dropped to 0.1 – 1 MPa,

- the hot reaction yields are taken from the expansion tank (7) along the tube (8) to the heat exchanger (4),

- then along the tube (9) the alcohol having separated in a gaseous state in the expansion tank (7) is directed back to the beginning of the process,

- the reaction yields are taken from the heat exchanger (4) through the tube (10) to the separator (11) where the new esters and new alcohol are separated leaving from relevant outlets (12) and (13).

2. Method as claimed in claim 1, **characterized** in that the transesterification reaction is performed according to the equation:

$M[-O(O)C-R^x]_n + nR^1-OH \rightarrow nR^x-COOR^1 + M[OH]n,$

- where R^1 indicates the aliphatic hydrocarbon radical having 1 to 10 carbon atoms, R^x indicates aliphatic hydrocarbon radicals having 2 to 30 carbon atoms, n is a number in the range of 1 – 6; M marks aliphatic or alicyclic multivalent radical containing 0 to 6-n (6 minus n) OH groups.

3. Method as claimed in claims 1 and 2, **characterized** in that there are preferably five alcohol molecules per ester link involved in one parent substance molecule.

4. Method as claimed in claims 1 and 2, **characterized** in that the ratio of ester and alcohol mass unit is preferably 1/3.

5. Method as claimed in claim 1, **characterized** in that the pressure of the reaction environment is preferably kept over 35 MPa.

6. Method as claimed in claim 1, **characterized** in that the temperature of the reaction environment is preferably within the range of 350 °C - 450 °C.

7. Method as claimed in claim 3, **characterized** in that there are even more preferably fifteen alcohol molecules per ester link involved in the parent substance molecule.

8. Method as claimed in claims 2 and 6, **characterized** in that the microwaves are used for heating.

9. Device for the continuous process transesterification of carboxylic ester in supercritical monovalent alcohol which would be used industrially and comprises the alcohol inlet (1), carboxylic acid ester inlet (2), reactant dosing unit (3), heat exchanger (4), transesterification device (5), hot reaction yield tube to expansion tank (6), expansion tank (7), tube of hot reaction yield to heat-exchanger (8),

reverse current tube of excess of alcohol (9), tube of cooled reaction yield to separator (10), separator (11), outlets of new ester and new alcohol resulting from the process (12 and 13), **characterized** in that the transesterification device (5) comprises the pump (14), the heat exchanger (15), tube-shaped reactor (16), outlet valve (17) and that the tube-shaped reactor (16) is closed with outlet valve (17), the output power of the pump (14) is 1-5% higher than the minimum necessary for opening the outlet valve (17), tube-shaped reactor (16) bears the temperature determined for the performance of the reaction and pressure needed for that at least for 1.7 times; outlet valve (17) opening pressure equals to the determined one and is 1-5% lower from the output power of the pump (14).

10. Device as claimed in claim 8, **characterized** in that the length of the tube-shaped reactor (16) is preferably at least 5 times bigger than the diameter.